

Notes on the species of OCHTHEBIUS of Boreal America.

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Our species of this genus have been described by Dr. LeConte with the single exception of *Holmbergi*, a type of which is in the collection at Cambridge. At the time of his review of the genus all my material was placed at his disposal and some of the types or duplicate types are now in my collection, so that all the species with one exception are now in my possession.

As the species are all of rather small size it is not an easy matter to describe the thoracic form and sculpture in such a manner as to make the differences easily appreciated. It has, therefore, seemed profitable to prepare sketches of them, so that with the aid of the descriptions the various species may be determined by those who possess them, without the necessity for reference to standard series.

Since the publication of the table of our species by Dr. LeConte (Proc. Amer. Philos. Soc. 1878, p. 378) an important review of the European species has appeared from Mr. A. Kuwert (Deutsche Zeitschr. 1887, p. 369). In this essay the seventy-eight species are divided into sixteen subgenera.

In a study of our species in a comparison with those of Europe it is possible, by allowing a little latitude to the subgenera, to admit certain of our species, while a number might warrant the formation of other subdivisions, but it seems to me unnecessary to burden our nomenclature with names for generic groups which have not full generic value.

The form and sculpture of the thorax give the readiest method of separating the species; these are supplemented by elytral differences which are neither so well marked nor constant. In all the species the thorax is narrowed at base, sometimes gradually with a slight sinuation as in *lineatus*, or with a deep, more or less abrupt sinuation, as in *discretus*. In every case there is a transparent side-margin extending sometimes from the apical angle to base, or merely from the beginning of the sinuation to base. In one species, *benefossus*, the border is extremely narrow and within the emargination. As a rule

the deeper the sinuation the wider the border, so that in those species with the feeble sinuation the border is very narrow. The apical edge has nearly always a pellucid border.

The sculpture of the disc of the thorax is important in the separation of the species, and consists of impressed lines or foveæ, which are apparently merely a modification of the simpler forms observed in *Helophorus*. There is, in the first place, the median impressed line, which may be quite a deep channel or a feeble line. In *sculptus* this line is practically obliterated, while in *Holmbergi* it is very short. Secondly, on each side of the median line are the discal foveæ, which are more or less deep, and vary in form and size. These have a tendency to revert to the simple lineate type of *Helophorus*, as may be traced through *puncticollis* to *sculptus* and *lineatus*. Rarely these discal foveæ are entirely wanting, as in *cribricollis*. External to the discal are the lateral impressions, which are more or less oblique in position and variable in depth, and in *laevipennis* existing as a mere trace.

The elytral sculpture exhibits the usual variation of the striato-punctate type, the striæ varying in depth and the punctures in size, depth and approximation.

The lateral margin of the elytra is slightly explanate, usually from the humeri to the middle, or slightly beyond, but in *benefossus* extending to the apex.

The species of *Ochthebius* at present known to me may be recognized by the following table:

Lateral margin of elytra explanate from the humerus to apex.

(*Cyrtochthebius*)

- Thorax deeply sinuate at posterior half, the transparent border very narrow; all the dorsal foveæ deep.....**benefossus.**
- Lateral margin explanate from humerus to middle or beyond, but never to apex..2.
- 2.--Thorax abruptly sinuately narrowing from one-third or less posterior to the apical angle, and with a pronounced angulation at middle of sinuation; transparent border broad.....(*Odontochthebius*) 3.
- Thorax abruptly sinuate from the middle, or deeply notched near the hind angles; transparent border broad.
- Thorax with well marked discal foveæ.....(*Trymochthebius*) 4.
- Thorax without discal foveæ.....(*Homalochthebius*) 5.
- Thorax gradually sinuately narrowed from apex to base; transparent border narrow.....(*Ochthebius*) 6.
- 3.--Thorax with all the discal depressions well marked; elytra with striæ of closely placed punctures; margin of pellucid border continuous.
- foveicollis.**
- Thorax with very feeble discal impressions, the surface polished; elytra almost absolutely smooth; pellucid margin sinuous...**laevipennis.**

- 4.—Sides of thorax behind the front angles straight, the transparent border beginning at the front angles.....**rectus**.
Sides of thorax arcuate in front, the transparent border beginning at the sinuation.
Disc of thorax coarsely punctured, the two discal foveæ on each side united by a deep groove between them.**puncticollis**.
Disc of thorax sparsely punctate, the discal foveæ separated..**discretus**.
Disc of thorax impunctate, the discal fovea separated.....**nitidus**.
- 5.—Prothorax coarsely punctate, the lateral foveæ deep and broad.
eribricollis.
- 6.—Median line of thorax distinct, extending two-thirds the length of thorax..7.
Median line of thorax extremely short or wanting..... 8.
- 7.—Discal foveæ of thorax of the usual form, but at times shallow.
Discal foveæ deep, the lateral shallow, transparent margin beginning near the front angles.....**interruptus**.
Discal foveæ feeble, the lateral deeper; transparent margin beginning about one-third from apical angles.....**atritus**.
Discal foveæ of thorax forming fine sinuate lines, disc rather flat; transparent border very narrow, beginning at middle..... **lineatus**.
- 8.—Discal impressions of thorax forming a continuous line; lateral foveæ broad and moderately deep... .. **sculptus**.
Discal impressions very vague, the posterior pair only distinct, these forming broad shallow depressions which are indefinitely confluent posteriorly; lateral foveæ formed of indistinct sinuous depressions.
Holmbergi.

The various subgeneric divisions into which our species seem most nearly to fall have been indicated in the preceding table, but with the exception of *Cyrtochthebius*, *Trymochthebius*, and probably *Homalochthebius*, the references are to be taken rather as parallels than positive references. As already intimated the divisions are mere tabular conveniences, and the advisability of attaching to them polysyllabic names seems doubtful.

O. benefossus Lec.—Piceous, surface slightly bronzed, legs pale. Thorax rapidly, arcuately narrowing from slightly in front of middle, the notch thus formed having a very narrow transparent border; apical margin sinuate at the front angles; disc very convex at middle, the sides beyond the lateral foveæ rather flat; surface sparsely punctate; median sulcus rather broad and deep, discal foveæ deep, separated, lateral impressions deep, broader at each end, usually entire, sometimes separated into two elongate triangular foveæ. Elytral margin distinctly explanate from base to apex, disc convex, striæ not impressed, composed of moderately large punctures, separated by their own diameters. Length .06 inch.; 1.5 mm. Pl. ii, fig. 1.

In this species the labrum is feebly triangularly notched at middle. The specimens from which Dr. LeConte described the species were part of my collection, and were the only ones with the deeply sinuate sides of the thorax in which the transparent border seemed absent,

it was therefore natural that he supposed this structure to be accidental, and that the entire notch, in well preserved specimens, was filled with the membrane. Since that time other specimens have been taken by Mr. C. H. Roberts, in Bennington County, Vermont and all show the narrow border as illustrated.

Occurs in northern New Jersey (Jülich) and Vermont (Roberts).

O. foveicollis Lec.—Piceous, surface distinctly zeneous, legs pale. Thorax rapidly, arenately narrowed from a point one fourth from apex, behind the middle, a second sinuation, the transparent border broad, gradually arcuate; apical margin with rather a deep sinuation within the angle; disc regularly, moderately convex, the surface smooth, with very few punctures; median line deep and long, discal foveæ moderately deep and well separated, lateral impressions large and deep. Elytra moderately elongate, the margin narrowly explanate a little beyond the middle, disc moderately convex with striæ, of closely placed, but with very coarse punctures, intervals at middle narrower than the striæ, the external wider. Length .04—.06 inch.; 1.2—2.5 mm. Pl. ii, fig. 2.

There is an extremely feeble emargination of the margin of the labrum. Having typical specimens before me of *foveicollis* and *tuberculatus*, I have not been able to find any special difference, except that the specimens of the former are smaller in size.

Two individuals from Pennsylvania have the elytra rather more oval, the punctures of the striæ a little less crowded; they may prove a distinct species, but are not really more different than the limits of difference observed in several other species.

Occurs in New Mexico (Moqui Villages), Florida (Enterprise and other places), Pennsylvania (Allegheny).

O. lævipennis Lec.—Dark castaneous, a slight bronze lustre on the head and thorax. Apical margin of thorax rather deeply sinuate within the angles, sides deeply and abruptly sinuate less than one-fourth from apex, a second sinuation from middle to base, the transparent border wide and distinctly bisinuate; disc regularly convex, smooth and shining, with scarcely a trace of a puncture, median line deeply impressed and long, the discal and lateral impressions reduced to two small foveæ on each side in front. Elytra rather broadly oval, the lateral border rather abruptly explanate a short distance behind the humeri and continuing two-thirds to apex, disc convex, surface smooth and shining with merely faint traces of the striæ of punctures. Body beneath colored as above, legs pale. Length .05 inch.; 1.3 mm. Pl. ii, fig. 3.

This species is readily known by the very smooth surface and reduction in number and size of the thoracic discal impressions. When the elytra are viewed directly from above, a short distance from the humeri appears parallel on each side, caused by a subhumeral depression and the rather abrupt expansion of the margin immediately posterior to it.

One specimen in my cabinet from California (Fort Tejon).

O. rectus Lec.—Oblong, rather depressed, piceous, dark bronzed, feebly shining, legs rufo-testaceous. Apex of thorax nearly truncate, a very slight sinuation within each front angle; side margin straight from angles beyond the middle, then with a moderately deep arcuate sinuation, the transparent border begins at the front angles with regularly arcuate margin, narrower in front and broad at the sinuation; disc regularly convex, the surface coarsely, closely and deeply punctate, median line deep and nearly entire, discal foveæ moderate, not sharply defined, but distinctly separated, lateral impression deep, broader in front and narrowed posteriorly. Elytra oblong oval, not very convex, the striæ composed of large, deep, closely placed, subquadrate punctures, the intervals extremely narrow. Length .06—.08 inch.; 1.5—2 mm. Pl. ii, fig. 4.

This species is the only one in our fauna in which the sides of the thorax are straight for a distance from the apex, and in which, with the deep post-median sinuation, there is a continuous transparent border from the apex to the base. The punctuation of the thorax is also coarser and denser than elsewhere seen, and the punctures of the elytral striæ larger, deeper, and every way more pronounced.

Occurs in California (Tejon and Los Angeles) and Wyoming (Como).

O. puncticollis Lec.—Form rather robust, head and thorax piceous black shining, elytra piceous slightly bronzed, legs pale. Apical margin of thorax distinctly sinuate near the front angles, sides arcuately expanded from apex to middle, thus abruptly arcuately narrowed to base, the transparent border wide and filling the posterior emargination only; disc moderately convex, the punctures moderately coarse, but not closely placed, the intervals smooth and shining; median groove deep and long, discal foveæ deep, the two on each side united by a moderately deep groove, lateral impressions deep and broad. Elytra moderately convex, the striæ composed of coarse, rather closely placed, subquadrate punctures, the intervals about half the width of the striæ. Length .06—.08 inch.; 1.5—2 mm. Pl. ii, fig. 5.

In some specimens the discal foveæ are so completely confluent that the sculpture approaches the type seen in *Helophorus*. The general sculpture of the surface, although moderately coarse, does not approach that seen in *rectus*, but resembles more nearly that of *discretus*.

Occurs in California (San Diego) and Arizona (Tucson and southward).

O. discretus Lec.—Form oblong, piceous, surface brown bronze, feebly shining; legs pale rufotestaceous. Apex of thorax slightly sinuate within each front angle and narrowly bordered with membrane; sides arcuate in front, at middle abruptly notched, the angle formed rather acute, the emargination deep; the transparent border wide behind, extending very narrowly in front of the emargination. Disc moderately convex, the punctures coarse, moderately close, but not dense, intervals shining; median groove rather broad and deep, discal

foveæ rather large, deep and well separated, lateral grooves deep. Elytra very little wider at base than the thorax, disc slightly depressed along the suture at base, striæ distinctly impressed, the punctures fine and close, intervals wider, slightly convex and transversely wrinkled. Length .06--.08 inch.; 1.5--2 mm. Pl. ii, fig. 6.

This species varies a little in the punctuation of the thorax; in some specimens it might be called rather sparse, while in most of them it is close, but not dense. It most closely resembles *puncticollis*, but the separate discal foveæ and the less dense punctuation will distinguish them.

Since the publication of the description by LeConte, the distribution of this species is found to be very wide. It extends from Los Angeles, in California, to Arizona, and northward to Oregon, thence eastward to Nevada, Utah, Colorado and Canada.

O. nitidus Lec.—Oblong oval, piceous, surface distinctly æneous, elytra paler, legs testaceous. Thorax fully twice as wide as long, very little narrowed posteriorly near the hind angles; apical border slightly sinuate within the angles, and with a narrow transparent border; sides arcuately divergent from the front angles to middle then abruptly, deeply emarginate to base, the emargination with a broad transparent border which does not extend to front angles; disc moderately convex, sparsely punctate shining, median groove moderately deep, discal foveæ deep and well separated, lateral impression deep, moderately broad, arcuate. Elytra very little broader than the thorax, striæ not impressed, composed of large, closely placed punctures, which become gradually more distant beyond the middle and at apex more obsolete, intervals near base narrower than the striæ, slightly transversely wrinkled. Length .07 inch.; 1.75 mm. Pl. ii, fig. 7.

Among the species here referred to the section *Trymochthebius*, this one may be known by the comparatively smooth thorax and by the elytral sculpture. In fact no other species has the elytra so nearly smooth at apex, excepting *levipennis*, which differs in too many other particulars to require comparison.

Evidently very widely distributed. The type is from Eagle Harbor, Lake Superior. Dr. LeConte adds, as a synonym, *fossatus* from Fort Yuma, while my specimen is from Oregon.

O. cribricollis Lec.—Moderately robust, piceous, with brown bronze surface lustre, sides of thorax and elytra paler, legs testaceous. Thorax twice as wide as long, distinctly narrowed to base; apical margin feebly bisinuate and with a very narrow transparent border; sides arcuate, and at basal third moderately deeply emarginate, the notch filled with transparent membrane, which extends a short distance along the base, but not to the apex; disc feebly convex, with coarse, deep, closely placed punctures, the intervals shining, median line rather finely impressed, discal foveæ entirely absent, lateral impression broad,

deep and arcuate. Elytra a little wider than the thorax, striæ distinctly impressed and rather broad, punctures coarse, deep and closely placed, but finer near the apex, intervals narrower than the striæ and slightly transversely wrinkled. Length .08 inch.; 2 mm. Pl. ii, fig. 8.

This species has the facies of *discretus*, but is readily known among those in which the thorax is deeply emarginate near the hind angles, by the entire absence of discal foveæ.

Occurs at Eagle Harbor, Lake Superior (LeConte), and in my cabinet from California.

O. interruptus Lec.—Form moderately elongate, pale piceous, surface distinctly æneous. Thorax nearly twice as wide as long, the apical margin broadly, but not deeply emarginate, a slight emargination within the angles; sides moderately deeply, but not abruptly sinuate behind the middle, the transparent border beginning very near the front angles and continuing the gradual curve of the sides; disc regularly convex, the punctures moderately coarse, but not close, median line moderately deep and long, discal foveæ moderate in size, deep and well separated, lateral impression deep and arcuate, a slight depression in the hind angles. Elytra oblong oval, not wider at base than the thorax, striæ slightly impressed at the sides, punctures moderate in size, subquadrate, closely placed, intervals as wide as in the striæ, slightly convex and nearly smooth, or slightly transversely wrinkled. Legs pale. Length .08 inch.; 2 mm. Pl. ii, fig. 9.

This species is intermediate in many respects between the series which precedes and those following, the thorax being rather more deeply sinuate behind the middle than in the next four, but much less so than in the preceding. The thoracic sculpture is not very unlike that of *attritus*, but deeper.

Occurs from the Peninsula of California northward to Vancouver, eastward to Wyoming, also in Arizona.

O. attritus Lec.—Moderately elongate, piceo-testaceous, surface distinctly æneous, legs pale. Thorax less than twice as wide as long, apex scarcely emarginate, a slight sinuation within each apical angle, sides slightly arcuate in front, a feeble sinuation beginning slightly in front of middle, the transparent border narrow, continuing the curve of the anterior third; disc feebly convex, the prolongation moderate, not close, median line distinctly impressed, discal foveæ shallow or nearly absent, lateral impression deeper and more coarsely punctured. Elytra slightly wider at base than the thorax, striæ scarcely impressed, punctures moderately coarse, closely placed and subquadrate, the intervals slightly narrower than the striæ, feebly convex and transversely wrinkled. Length .06 inch.; 1.5 mm. Pl. ii, fig. 10.

Under this name are included two species described by Dr. LeConte from uniques, *attritus* and *simplex*, the only perceptible difference being in the degree of thoracic sculpture, the former having the foveæ faintly marked, while in the latter they are nearly obliterated.

ated. There is also a slight difference in size. Inasmuch as the variation here shown is amply illustrated in species more abundantly represented by specimens, and known to have no specific value, the two species have been united.

Occurs in Florida, Hanlover (Schwarz).

O. lineatus Lec.—Oblong, feebly convex, piceo-testaceous, surface faintly bronzed, legs pale. Thorax not much wider than long, apex broadly, but feebly emarginate; sides arcuate in front, slightly sinuate and narrowing to base, with a very narrow transparent border. Disc feebly convex, surface granularly alutaceous, not punctured, median line finely impressed, not long, sometimes very vague, discal foveæ replaced by impressed arcuate lines, a vague transverse depression between the apex and base of these lines, lateral impressions shallow, the inner side limited by an oblique line, sometimes a vague impression near the hind angles. Elytra a little broader at base than the thorax, the striæ faintly impressed, punctures moderate and closely placed, intervals slightly convex, and at middle narrower than the striæ. Length .06--.08 inch.; 1.5-2 mm. Pl. ii, fig. 11.

The thoracic sculpture of this species shows the most decided approach to the *Helophorus* type of any in our fauna. At the same time it seems more nearly to represent the true *Ochthebius*, of Europe, as defined by Kuwert.

Occurs in Oregon, California, Arizona, Colorado, Texas and New Mexico.

O. sculptus Lec.—Piceous, shining, surface slightly green bronze. Thorax nearly twice as wide as long; apex broadly emarginate, a slight sinuation within the angles. Sides arcuate, a very slight and gradual sinuation beginning at apical third, the transparent border correspondingly narrow. Disc regularly convex, sparsely punctate, the intervals smooth, median line entirely obliterated, discal foveæ replaced by a slender line, lateral fosse broad but not deep, more closely punctate, a slight fovea near the hind angles. Elytra a little wider than the thorax, striæ not impressed, punctures moderate, subquadrate, not closely placed, finer toward apex, intervals flat, broader than the striæ, faintly wrinkled. Length .06 inch.; 1.5 mm. Pl. ii, fig. 12.

This species is very distinct by the total obliteration of the median line of the thorax. The discal foveæ are replaced here, as in *lineatus*, by an entire slender line, somewhat deeper posteriorly.

Occurs in California and Arizona. Dr. LeConte notes a specimen in my cabinet from Canada, but it is not now before me.

O. Holmbergi Mann.—Piceous, faintly bronzed, moderately shining. Thorax less than twice as wide as long, apex broadly emarginate, without sinuation near the angles. Sides arcuate in front, slightly sinuate toward the base, the transparent border narrow, extending from the front angles and somewhat wider behind. Disc moderately convex, sparsely punctate, median line short,

feeble, discal foveæ represented by vague, flat impressions, more or less distinctly limited on the outer side by an impressed line, the two posterior foveæ vague, confluent at the median line, lateral impressions broad and shallow. Elytra a little broader at base than the thorax, the striae slightly impressed, punctures not large, closely placed, intervals slightly convex, as wide as the striae at middle, or wider at the sides, distinctly wrinkled transversely. Length .06—.08 inch.; 1.5—2 mm.

In the specimens from Canada the thoracic sculpture is extremely vague, while in those from California there is quite a distinct line defining the position of the foveæ in the same position as in *lineatus* or *sculptus*.

Occurs from southern California to Nevada, Colorado, Canada and Alaska.

The species of *Ochthebius* do not seem to have received much attention on the part of the general collector. Whether this will account for the great inequality of distribution remains to be seen. In looking over the localities given for the species it will be observed that the very large majority of them are either from the Pacific coast region, or from the extreme southwest, as Texas or Arizona. Although collectors of great skill have explored these regions, it is hardly likely that the numerous collectors of our Atlantic region would have allowed them to escape notice. It may, therefore, be possible that but few species remain to be discovered in the eastern regions.

In my own experience *Ochthebius* prefers clear running, shallow water, in which localities they may be found adhering to the underside of stones, preferably those partly out of water, as they must at times come to the surface for a fresh supply of air. Frequently they are found in small colonies like the smaller *Elmidæ*, which they much resemble in their habits. They are not so easily detected as *Elmidæ*, from the fact that their flatter form enables them to lie more closely in contact with the surface of the stone, or hide themselves in small crevices. They are beautifully sculptured insects when seen with moderate magnifying power, and will well repay the trouble of their collection.

From the fact that a certain number are known to have wide distribution, it is probable that careful collection will extend the distribution of others. *O. discretus*, for example, extends the entire length of our west coast and eastward from Oregon to Canada; *O. foveicollis* is known from New Mexico, Florida and Pennsylvania; *O. inter-*

ruptus is found from Arizona to Oregon. With these few words further observation is left to the industrious collector, with the hope that additional data in distribution will become known and thought worthy of publication.

Bibliography and Synonymy.

OCHTHEBIUS Leach.

- O. *benefossus* Lec., Proc. Amer. Philos. Soc. 1878, p. 381.
 O. *foveicollis* Lec., loc. cit. p. 381.
 tuberculatus Lec., loc. cit. p. 380.
 O. *lævipennis* Lec., loc. cit. p. 381.
 O. *rectus* Lec., loc. cit. p. 379.
 O. *puncticollis* Lec., Ann. Lye. v, p. 210; Proc. Acad. 1855, p. 361; loc. cit. supra p. 378 (table).
 O. *discretus* Lec., Proc. Amer. Philos. Soc. 1878, p. 379.
 O. *nitidus* Lec., Agassiz Lake Superior, p. 217; Proc. Amer. Philos. Soc. 1878, p. 380.
 fossatus Lec., Proc. Acad. 1855, p. 362.
 O. *cribricollis* Lec., Agassiz Lake Superior, p. 217; Proc. Amer. Philos. Soc. 1878 (table).
 O. *interruptus* Lec., Ann. Lye. v, p. 210; Proc. Amer. Philos. Soc. 1878, p. 379 (table).
 O. *atritus* Lec., Proc. Amer. Philos. Soc. 1878, p. 380.
 simplex Lec., loc. cit.
 O. *lineatus* Lec., Ann. Lye. v, p. 211.
 O. *sculptus* Lec., Proc. Amer. Philos. Soc. 1878, p. 381.
 O. *Holmbergi* Mann., Bull. Mosc. 1853, iii, p. 166; Lec., loc., cit. p. 379 (table).

DESCRIPTION OF PLATE II.

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| Fig. 1.—Thorax of <i>O. benefossus</i> . | Fig. 8.—Thorax of <i>O. cribricollis</i> . |
| “ 2.— “ <i>O. foveicollis</i> . | “ 9.— “ <i>O. interruptus</i> . |
| “ 3.— “ <i>O. lævipennis</i> . | “ 10.— “ <i>O. atritus</i> . |
| “ 4.— “ <i>O. rectus</i> . | “ 11.— “ <i>O. lineatus</i> . |
| “ 5.— “ <i>O. puncticollis</i> . | “ 12.— “ <i>O. sculptus</i> . |
| “ 6.— “ <i>O. discretus</i> . | “ 13.— “ <i>O. Holmbergi</i> . |
| “ 7.— “ <i>O. nitidus</i> . | |